TIDs investigation by two-dimensional TEC mapping and ionosonde

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Abstract

Simultaneous observations of the ionosphere using the ionosonde and dense GPS / GLONASS receivers network allow us to investigate TIDs parameters by two independent methods. Two-dimensional TEC perturbation maps using 150 GPS / GLONASS receivers were obtained. The distance between the network cells is about 40 km and the temporal resolution of the network is 30 seconds. The ionosonde works in one minute cadence. The ionosonde located inside the GPS / GLONASS sounding area. Daytime MSTIDs with wavefronts stretching in NE–SW direction are observed on TEC maps. These structures propagate southeastward at the velocity of 100– 150 m/s. Their wavelengths are 250-300 km and amplitudes are larger than 0.4 TECU. For the same time the ionogram variations of F_2-peak plasma frequency with peak-to-peak amplitude near 0.3 MHz are observed. The periods of TEC perturbations and F_2-peak frequency variations are close (~40 min). The maximum deviation of F_2-peak frequency corresponds to minimum value of TEC perturbation over the ionosonde.

Image

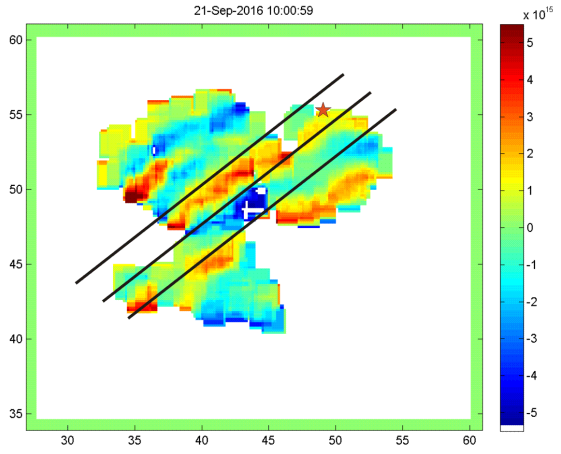


Figure1. TIDs on two-dimensional TEC perturbation maps

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Biography

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